OFFICIAL COURT REPORTER, LYCOMING COUNTY

we're taking. Currently we're using GENSCAN and 1 2 Genotyper. There's a variety of versions for that. 3 versions of GeneMapper. We are looking into GeneMarker. So what are we up to? Six different versions of software. 4 5 We have a custom homemade version of a program called 6 Genofiler. For statistical analysis we have sort of a 7 desktop calculator specific to forensics DNA called 8 GenoCAD. In addition to Microsoft Office, you know, Word 9 and Excel for -- for calculations and report writing. 10 Depending on the case at hand if there was a probabilistic 11 system we might use one of those systems depending on what 12 questions have been asked of us and what we're interested 1.3 in doing. So I've personally used maybe seven or eight of 14 the 12 different probabilistic genotyping software 15 programs Dr. Perlin described as on the market currently. 16 Are there -- are there individuals that send you DNA to be tested? 17 18 Physical samples? Α Yes. 19 0 20 Α No. 21 You usually receive data? Q 22 Α We don't have testing capabilities at our office. 23 Q Okay. So you don't have the equipment on site 24 that would be used for actually extracting, amplifying 25 DNA from human samples?

1 That's correct. 2 Nor do you advertise yourselves as being able to 3 do that? No. We -- anybody who calls inquiring about that, 4 we'll refer them to a lab who does that and has that 5 6 capability. 7 Have you written any publications in your area of 8 expertise? In terms of journal articles I haven't had any 9 10 journal articles published. I have written some. 11 one that will hopefully be coming out in a couple months. 12 That is not a peer reviewed journal. 1.3 Have you contributed to any other publications 14 like books, anything like that? 15 I haven't authored any book chapters. Α 16 Have you ever worked in a lab that does DNA Q 17 analysis? 18 Forensic DNA analysis? Α 19 Yes, sir. Q Not forensic DNA analysis. I worked in a medical 20 21 lab for a while. 22 What was the nature of your college curriculum as 23 it relates to the hard sciences such as biology, 24 chemistry, biochemistry? 25 As in the courses that I took in the past during

college? 1 2 Yes, sir. 3 So the requirements for a computer science degree at Wright State required a year of what we would consider 4 5 hard laboratory science. That would be general chemistry or general biology. I took general chemistry. I took 6 7 advanced physics in high school, but none at the college level. I took a course in biochemistry. I have a course 8 9 in genetics. Several courses in bioinformatics, that's 10 the integration of computing and applying the principle of 11 computer science specifically to biological data. I said 12 general chemistry, genetics. Anatomy, physiology I took a 1.3 year of. And most of my other courses have been specific 14 to computer science or other general educational 15 requirements. 16 Thank you. Have you ever reported on Okay. 17 forensic DNA evidence in a criminal case? 18 What do you mean reported on? Α 19 Reported the results of an analysis that's done Q 20 using a computer program instead of DNA data? 21 I don't believe I've authored, signed any 22 statements providing statistical weights to a Court. What type of statistics and mathematics classes 23 Q 2.4 did you take in college?

CAMALA JORDAN
OFFICIAL COURT REPORTER, LYCOMING COUNTY

I took a statistics course and then a number of my

25

computer science courses involved different types 1 2 statistical analysis. 3 What was the statistics course that you took? I don't recall the name of it. It was the one 4 5 that's required for engineers. Okay. Are you -- how familiar are you with the 6 mathematical undercarriage -- underpinnings of TrueAllele 7 software? 8 9 What do you mean how familiar? I mean, I know 10 their equations of the difficult questions that qualify. 11 Q Well, are you familiar with the type of 12 mathematics that is utilized by TrueAllele to do what it 13 does? 14 Both Bayesian Statistics and the computing 15 algorisms known as Markov Chain Monte Carlo. Yes, I'm 16 familiar with those. 17 Okay. Have you taken classes in those areas? 18 I'm not aware of classes specific to Markov Chain 19 Monte Carlo. I'm not even aware of classes that are --20 are simply Bayesian Statistics, but I haven't taken any 2.1 courses exclusive to those. 22 Was your -- your knowledge in those areas from 23 your own independent study? Some of it, yes. Some of it's from coursework as 2.4 Α 25 well.

1

2

3

4

5

6

7

8

9

10

11

12

1.3

14

15

16

17

18

19

20

21

22

23

24

25

Q The -- the term probabilistic genotyping came up during your direct. What training have you had in the area of probabilistic genotyping?

Back in -- in 2014 -- the spring of 2014 was when my personal and professional interest really turned toward probabilistic genotyping from the more general, what we would say as traditional DNA analyst. That summer I was able to attend a week long workshop held by the Midwest Association of Forensic Sciences. They're a regional professional organization for forensic scientists. And they exhibited one probabilistic genotyping program per day for a week so I attended those, the last day being a presentation of TrueAllele where I saw Dr. Perlin speak via webinar or webcam, whatever you call that. And since then we've been conducting -- at work through my company we've been conducting ongoing trainings on the various systems and watching webinars ourself. We're in Dayton, Ohio it's not a hot bed of conferences that people come from out of town so we have to attend meetings in Orlando, New York, Chicago, Seattle, those places to attend ongoing trainings and conferences.

- Q Have you been attending those conferences?
- A I've been attending several conferences and workshops per year since I started.
 - Q On probabilistic genotyping?

They include that. Some of the conferences are 1 2 more specific to probabilistic genotyping. Some are 3 included as a -- one of the bullet points that they 4 address. 5 Can you tell me about the specific ones and where 6 they were? 7 Well, starting with the week in St. Louis in 2014. 8 There have been a number of workshops and conferences 9 where speakers have gone for anywhere in between 10 10 minutes and several hours discussing the application of 11 probabilistic genotyping to specific data in a case, the 12 development or the design of a particular system, the 1.3 transparency of a system, the comparison of two different 14 systems or more. There have been a series of webinars put 15 on by the National Institute of Standards and Technology 16 including comparison studies between multiple systems. I 17 don't recall the dates of watching those, but on my CV 18 there's the dates where I've attended these -- these 19 various workshops. Probabilistic genotyping is -- is a 20 very interesting topic to many people in the field of 21 forensic DNA and is gaining rapid interest at the same 22 time. It's --23 Do you have a copy of your CV? Q 2.4 MR. MIELE: I sent a copy. Here.

CAMALA JORDAN
OFFICIAL COURT REPORTER, LYCOMING COUNTY

And I have it marked as Defendant's

THE COURT:

25

1 18.

2 MR. MIELE: Yes, Your Honor.

3 THE WITNESS: It would be fair to say that

4 at --

5

6

7

8

9

10

11

12

1.3

14

15

16

17

18

19

20

21

22

23

2.4

25

BY MR. WADE:

Q Hold on a second. I haven't asked a question yet.

A I was continuing to explain where I've been exposed to probabilistic genotyping.

Q Oh. Continue. My mistake.

A It would be fair to say that -- that on all of those continuing education meetings at least a portion of the time has been devoted to discussion of probabilistic genotyping systems. At least since 2014.

Q Okay. Have you yourself written or attempted to write a computer program that can interpret DNA mixture evidence?

A Interpret? In terms of reporting out a conclusion that human — as opposed to a human reporting out that conclusion, I have not. It's actually a frequent term of nondisclosure agreements and Court Orders that I've been signing that swear to that so I'm actually inhibited a little bit as to how much development I could do if I were inclined.

Q And, I'm sorry, when you testified in Seattle were you qualified as an expert?

1	A I'm not very familiar with the legal process of
2	qualifying someone as an expert. I don't recall anybody
3	saying, you're now qualified as an expert.
4	Q So you've never been qualified as an expert?
5	A I don't recall I don't recall it.
6	MR. WADE: What was the offer?
7	THE COURT: As an expert in DNA data and
8	analysis.
9	MR. MIELE: Judge, I think it was data analysis
10	without the and.
11	THE COURT: Oh.
12	MR. MIELE: Sorry.
13	THE COURT: Maybe there was pause in your speak
14	and that's why I took an and.
15	MR. WADE: I'm going to object. I believe the
16	offer's a little bit too broad.
17	THE COURT: Okay. Why don't we come up to
18	sidebar and we'll talk about it. Okay, ladies and
19	gentlemen, if you want to distract yourself from what
20	we're talking about.
21	(Whereupon, the following discussion was held
22	between the Court and counsel at sidebar:)
23	THE COURT: Mr. Wade, you objected at this
24	point to this witness?
25	MR. WADE: Yeah. As far as I can tell the only

1	different way?
2	MR. WADE: I mean, I'm opposed to a
3	qualification in the area of statistics. He's taken one
4	college course, statistics for engineers.
5	MR. MIELE: He's been doing it for four years.
6	He's worked on a dozen cases
7	THE COURT: Well
8	MR. MIELE: in which Perlin has been
9	involved, dozen to two dozen cases Perlin's been involved.
10	THE COURT: And what happened with those cases?
11	MR. MIELE: I didn't ask the results. I don't
12	know the results.
13	THE COURT: Because I
14	MR. MIELE: A lot of them probably go toward
15	admissibility also.
16	THE COURT: Of the doctor's results?
17	MR. MIELE: Of the doctor's program whether
18	it's admissible.
19	THE COURT: Then it wouldn't be in Pennsylvania
20	because it is admissible.
21	MR. MIELE: Outside of Pennsylvania.
22	MR. WADE: I mean, if the word genotype comes
23	out of his mouth, I'm objecting. He doesn't know what a
24	genotype is.
25	MR. MIELE: Yes, he does.

MR. WADE: He's not qualified to even talk 1 2 about it. 3 THE COURT: But he doesn't have the 4 background --5 MR. MIELE: Yeah, he does. 6 THE COURT: -- to be able to talk about that 7 and much of the information he's provided any more than I 8 would based upon my training and my experience. I'm not 9 hearing from his testimony -- I mean, I'm reading 10 testimony by expert witnesses from the rules. I'm just 11 trying to make sure it's apples and apples here. 12 MR. MIELE: It is apples to apples in the sense 1.3 that we're talking about his results. We're not talking 14 about the DNA. We don't care what the DNA results -- that 15 the loci is seven and 11. No one cares about how they got 16 there. We accept all that as true. 7,11 is 2.3 percent. 17 Okay. The next one is whatever that is. Statistically, 18 what does that result in? How does that result? Does 19 that result in what Perlin's saying? Is there another way 20 to look at that? The probability -- what is the 21 probability of Washington's DNA is in fact there? 22 it? Perlin says it's a worthless number. He was asked 23 that. It's a worthless number. We're going to say it's 2.4 not a worthless number. This is how it's calculated. 25 We're not challenging DNA. There's nothing biological

1 about this other than you use the terms, allele, loci, 2 locus, and those types of things. Use the terms. 3 THE COURT: Put it into context. 4 MR. MIELE: Put it into context otherwise --5 THE COURT: Okay. 6 MR. WADE: DNA is expressed in terms of 7 statistics and to give a statistic about DNA is to present 8 yourself -- you have to have a certain background to even 9 understand how DNA can be expressed as a statistic. He 10 doesn't have it. He can critique what this guy has done, 11 but ultimately he doesn't have the educational training 12 and experience to even be able to articulate to them how a 1.3 biological sample can result in a statistic. I don't 14 think he gets to start off --15 THE COURT: But I don't think that he's been 16 asked that question. MR. WADE: It's in his report. 17 18 THE COURT: Well -- and I know that. 19 MR. WADE: So --20 THE COURT: But I haven't heard the questions 21 that are being asked and that's why I'm saying what I'm 22 saying is I don't think he is able to be qualified to be 23 testifying as an expert in that. 2.4 MR. MIELE: To what, Judge? 25 THE COURT: To exactly what Mr. Wade just said,

```
which is translating into DNA -- how did you say that?
 1
 2
       don't want to misspeak.
 3
                  MR. WADE: Well, I mean -- explain --
                  THE COURT: Translate --
 4
 5
                  MR. WADE: Explaining how DNA data can be
 6
       translated is statistics. That's the meaning of it.
 7
                  THE COURT: You just want the numbers?
 8
                  MR. MIELE: We can't explain how DNA data can
 9
      be translated. We're not talking science. We're not
10
       talking DNA, biology. We're talking about the statistics
11
       of it.
12
                  THE COURT: But the problem is you have to know
1.3
       something about DNA to be able to calculate a result that
14
       says this person can be excluded as a parent of this child
15
       or this person can be excluded --
16
                  MR. MIELE: We're not saying that. He's saying
       what the percentages are. If the percentages are right.
17
18
       What's the probability of Washington's results? We're
19
       accepting at face value what the DNA results are.
20
                  THE COURT: So -- so your --
21
                  MR. MIELE: We're not challenging any of that.
22
                  THE COURT: You're not challenging the data
23
       that was realized by the State Police --
24
                  MR. MIELE: Correct.
25
                  THE COURT: -- or by Sorenson?
```

1	MR. MIELE: That is what it is.
2	THE COURT: The raw data.
3	MR. MIELE: He doesn't he doesn't care about
4	the raw data and Dr. Perlin doesn't care about the raw
5	data. He cares about the statistical results.
6	MR. WADE: Maybe I can give some examples of
7	where we're going to run into some serious problems almost
8	immediately. One of the areas he talks about in his
9	report in his in the middle of his report is the
LO	idea of dropout and how statistics can be altered by the
L1	phenomenal dropout, which is something that happens in DNA
L2	in the molecular level and results in an absent peak from
L3	the data set. He's not qualified to talk about that. I'm
L 4	going to object, you know.
L5	MR. MIELE: Object.
L 6	THE COURT: I would agree with that.
L7	MR. WADE: But that's that's we're
L8	talking we're going through his report now.
L9	THE COURT: DNA data analysis.
20	MR. MIELE: Yes.
21	MR. WADE: And he says, due to this thing about
22	dropout this thing and this thing, the system's
23	unreliable and the results are unreliable. So
24	MR. MIELE: We're talking about reliability.
25	THE COURT: But that's your offer for him is

1	DNA data analysis. And for him to be able to make that
2	statement, he doesn't he hasn't presented testimony
3	that I heard that would qualify him to be able to make
4	that statement.
5	MR. MIELE: We're not going after the
6	reliability and we're not going after the DNA, it's
7	statistics. It's the analysis of a statistical review of
8	results of the alleles, loci, and such.
9	THE COURT: Well, I guess the first I feel
10	comfortable in giving him expertise in is computer
11	science. I mean, that's the general description of what
12	he's describing and the use of computers and calculating
13	statistics.
14	MR. MIELE: And applying it to the DNA results?
15	THE COURT: And applying it to probabilities,
16	but see, when you say DNA results, then we run into the
17	issue that Mr. Wade
18	MR. MIELE: Not the scientific side of it.
19	THE COURT: Correct. That's but that's why
20	I'm reluctant to extend it to the DNA because he can't
21	MR. WADE: You don't know what a loci is
22	because you've never seen one because you've never done
23	DNA testing. You're talking about things you've read
24	about and workshops.
25	MR. MIELE: That's how people become qualified.

You don't have to -- you don't have to test the loci to 1 2 become qualified to talk about it. 3 THE COURT: You don't, but you have to work 4 with --5 MR. WADE: Our guy did. 6 MR. MIELE: Have to do what? 7 THE COURT: Have to work with and have a 8 reasonable pretension of what knowledge --9 MR. MIELE: He does. He does. Again, he has 10 been doing this for four years, he's reviewed a dozen to 11 two dozen TrueAllele reports and has testified on the 12 reports on those challenging what Dr. Perlin does. 1.3 THE COURT: And that's why I'm saying the 14 number part of it -- if it's just purely a number issue, 15 then --16 MR. MIELE: It probably is. 17 THE COURT: Then I would give him that leeway. 18 But if it comes to making a conclusion about why 19 certain -- like he said, the example of dropout and why 20 you get certain results. 21 MR. MIELE: I don't think we can do that. 22 MR. WADE: I mean, yeah. I'm just wondering 23 what in the report are we going to cover --THE COURT: Well, then I guess --24 25 MR. WADE: -- if we're not going to cover that.

1	THE COURT: That would be one area that he
2	wouldn't be able to cover. You can't make statements like
3	that because I wouldn't certify him as an expert in that
4	and I'm not sure how to describe what it is
5	MR. WADE: Here's another example. He's going
6	to talk about the difficulty in estimating the numbers of
7	contributors in the DNA mixture. He doesn't know he's
8	not qualified to talk about how you estimate the number of
9	contributors. He's never done it. He doesn't know how it
10	works.
11	THE COURT: And I'm believing you have to have
12	more experience than just reading about it to understand
13	how to do that.
14	MR. MIELE: You have to actually do the testing
15	yourself?
16	THE COURT: Or at least observe it. At least
17	work with a lab.
18	MR. MIELE: I disagree with the Court. I
19	disagree. I think an expert can inquire to the knowledge
20	by any means including study and not
21	THE COURT: I'm not saying had to do it. But
22	he can at least observe it by people that know how to do
23	it.
24	MR. MIELE: I guess I don't agree.
25	THE COURT: Because what if he's reading

```
articles that aren't peer reviewed and he's learning
 1
 2
       something that isn't approved in the -- in the scientific
 3
       community? That's -- that's the issue.
 4
                  MR. MIELE: I disagree with the Court.
 5
                  THE COURT: He's talking about his writings --
 6
       not peer review journals. I mean, I'm willing to give you
 7
       the mathematical statistical part of it, but I'm -- I'm
 8
       concerned about the -- how far after reading his report
 9
       and hearing the objection, how far he can get. So that --
10
       that's where -- so I don't know how you want me to
11
       characterize that. That's -- that's what I feel
12
       comfortable doing is I'll give him as an expert in
1.3
       computer science and statistics, but with respect to his
14
       reasonable pretension of knowledge in the area of DNA, no.
15
       he doesn't have that.
16
                  MR. MIELE: It depends on what you're saying is
17
       knowledge in DNA.
18
                  THE COURT: Because I don't know where you're
19
       going with it.
20
                  MR. MIELE: Biological is in DNA.
21
                  THE COURT: Correct.
22
                  MR. MIELE: We're not going there. We're not
23
       going to talk about their DNA -- that chart that Perlin
24
      put on.
25
                  THE COURT: Well -- but that's not what the
                         CAMALA JORDAN
```

OFFICIAL COURT REPORTER, LYCOMING COUNTY

```
report gives me the impression so that's why I have to
 1
 2
       wait --
 3
                  MR. MIELE: It also talks about --
 4
                  THE COURT: -- and see.
                  MR. MIELE: He also talks about he doesn't know
 5
 6
       where Perlin comes up with these numbers, he talks about
 7
       in his report where there are numbers not reported.
 8
                  THE COURT: But then if you've got raw data and
 9
       you're pointing to the raw data, he certainly can do that.
10
                  MR. MIELE: Which is --
11
                  THE COURT: Right.
12
                  MR. MIELE: Yes.
1.3
                  THE COURT: Right.
14
                  MR. MIELE: That's where we're going to.
15
                  THE COURT: So that's -- that's where I'm
16
       coming from. Computer science.
17
                  MR. MIELE: And statistics is what you said.
18
                  THE COURT: Statistics, but not DNA data --
19
                  MR. MIELE: Okay.
20
                  THE COURT: -- analysis.
21
                  MR. MIELE: Okay. We object, but so be it.
                  THE COURT: Well --
22
23
                  (Whereupon, the discussion held at sidebar
24
      between the Court and counsel was concluded.)
25
                  THE COURT: Thank you. Okay. The objection is
```

overruled to the extent that the Court will allow him to 1 2 testify as an expert in the area of computer science and 3 statistics. Mr. Miele. 4 MR. MIELE: Yes, Your Honor. 5 DIRECT EXAMINATION 6 BY MR. MIELE: 7 Mr. Adams, did you become involved in this case at 8 our request? 9 Α Yes. 10 And what material did you have provided to you to 11 help you review the case? 12 Originally, I believe it was a couple papers sent 1.3 in PDF and then as time went on, the crux of the material 14 that we spent time working with was the DVD provided by 15 Cybergenetics I believe to the DA first. 16 And was that the disk and information that I think 17 Dr. Perlin identified earlier today? 18 Yes, sir. The four gigabytes he referred to. Α 19 You have in front of you I think what's been 20 marked as Defendant's Exhibit 17, case packet. Was that 21 also provided to you on the disk or some other way? 22 Α Yes, it was on a disk. 23 Okay. And have you had a chance to review that? 24 Yes, sir. Α 25 Have you had a chance to review Dr. Perlin's two Q CAMALA JORDAN

OFFICIAL COURT REPORTER, LYCOMING COUNTY

reports, both his preliminary report and his final report 1 dated December 1st of 2015? 2 3 Yes, sir. What other information, if any, did you review 4 prior to writing your report? 5 6 I read the -- the standard operating procedures 7 that were provided for the -- the TrueAllele system as 8 well as the manual for the software so that is about four 9 or 500 pages of manuals and materials that I recall 10 specifically reading in this case, though I've read many 11 of them in other cases as well. 12 Q That's what I was going to ask you. How many 1.3 times previously have you read the manuals and other 14 documents about TrueAllele provided by Cybergenetics for 15 TrueAllele? 16 I've been provided them several times. I don't 17 recall how many times. I haven't seen them in every 18 TrueAllele case involved --19 This isn't the first time that you've read those 0 20 manuals or seen them? 21 It's not the first time. 22 Is this the first time you seen a case packet such 23 as the one we received here? 2.4 It's not the first time. Α 25 And you've had a chance to review them on other Q CAMALA JORDAN

OFFICIAL COURT REPORTER, LYCOMING COUNTY

to do it at sidebar? 1 2 MR. WADE: Sidebar please. 3 MR. MIELE: We can do it at sidebar. 4 THE COURT: Okay. Ladies and gentlemen, if you 5 could distract yourselves from what we're talking about 6 please. 7 (Whereupon, the following discussion was held between the Court and counsel at sidebar:) 8 9 THE COURT: My concern is the fact that in his 10 expert report since his expertise has been narrowed down 11 at this point that what he does in his conclusions he has 12 referred to relevant literature, which does not speak to 1.3 his own personal knowledge or expertise. And that's why 14 I'm having a problem with it. It's not a statistical or 15 non-statistical. His opinion he's basing it on is based 16 upon knowledge that he's getting from relevant literature that speaks to this, but he doesn't have any training or 17 18 experience in it. That's where I'm hung up so that's why 19 I wanted to talk to you about it at sidebar. 20 MR. MIELE: Again, when you take a statistical 21 analysis, you know, how does the contributors change the 2.2 percentage, change his conclusions? THE COURT: Because it's basing his opinion 23 2.4 upon -- because he's basing his opinions on writings of 25 other people and taking what they say -- they say as

1	possible as opposed to his own.
2	MR. MIELE: I think experts are allowed to rely
3	upon the works of others. In other words
4	THE COURT: In their own field.
5	MR. MIELE: And
6	THE COURT: The same thing. These are what
7	because I haven't read everything independent in his
8	report what I'm believing is experts in the field of
9	biology, or DNA, or genetics, making these conclusions and
10	he's accepting their conclusions of coming his own in the
11	statistical area. Which based upon his expertise he
12	doesn't have the ability to do. That's that was my
13	concern.
14	MR. MIELE: Sure. Okay. And we object.
15	THE COURT: Well, that's why I wanted to do it
16	at sidebar.
17	MR. WADE: I object so you rule on the
18	objection.
19	THE COURT: And I'm sustaining the objection.
20	MR. MIELE: And I
21	THE COURT: But place your objection to my
22	ruling on the record.
23	MR. MIELE: Yeah. That's what I tried to.
24	I'm sorry. Premature objection. We're objecting to the
25	ruling. We think it's an appropriate area for him to talk
	CAMALA JORDAN

1	about.
2	MR. WADE: Judge, just one more thing. The
3	last sidebar ruling wasn't announced to the jury so I
4	don't know if they knew the outcome.
5	THE COURT: I thought it was.
6	MR. WADE: The one before and before was, but I
7	could have a bad memory. Like I said, my brain is
8	shutting down.
9	THE COURT: I understand. Okay. All right.
10	(Whereupon, the discussion held at sidebar
11	between the Court and counsel was concluded.)
12	THE COURT: Okay. The objection's sustained.
13	MR. MIELE: I'm sorry, Judge. We have a
14	witness here who has to get back to work and we're trying
15	to deal with him and getting him back another day because
16	obviously we're behind schedule. So I apologize for the
17	delay.
18	THE COURT: No problem.
19	MR. MIELE: Your Honor, may we approach just to
20	put something on the record?
21	THE COURT: Okay. Ladies and gentlemen, if you
22	don't mind distracting yourself. I think this will be
23	relatively brief.
24	(Whereupon, the following discussion was held
25	between the Court counsel at sidebar:)